

VESICULAR STOMATITIS SYMPOSIUM

Vesicular Stomatitis (VS) is a quarantinable disease that poses significant economic hardships to livestock producers. Due to the economic ramifications associated with the disease, both to the individual producer, and to the industry as a whole via lost export opportunities, U.S. cattlemen are very aware of and concerned with VS. At the request of a number of commodity organizations, a research symposium on VS was held July 30, 1997, in Reno, Nevada. The symposium, facilitated by the National Cattlemen's Beef Association and the U.S. Animal Health Association's "Blue Ribbon Panel on VS Research", was designed to bring together individuals actively engaged in VS research and interested commodity organizations. Research findings and proposals, initiated after the 1995 outbreak of VS (New Jersey strain) in the Southwestern U.S. were discussed. Also discussed was the current 1997 VS epizootic of VS (Indiana strain). Interestingly, the Indiana strain of VS has not been reported in the U. S. for approximately 30 years.

Epidemiology

Several field studies have been conducted to understand VS epidemiology in the U. S. Case control studies conducted by Colorado State University and USDA/APHIS on premises in Colorado, including those premises diagnosed with VS in 1995, indicate a total of 1.3% of tested animals were seropositive for VS (31% of these were equine). These results showed clinically healthy animals were infected with VS during 1995. Additional seroprevalence studies in Arizona since the 1995 epizootic, found approximately 3% of non-clinical tested animals were seropositive for VS. Seroprevalence studies continue to show that VS infections during the epizootic were more prevalent than clinical observations.

USDA/APHIS reported on a study designed to assess risk factors for VS virus on 1995 affected vs. non-affected premises through questionnaires solicited from livestock owners. Animal movement on/off a premise, and exposure to water sources and/or wild life could not be demonstrated as a risk factor. However, exposure on pasture was identified as a risk factor. Animals housed for any period of time in barns and sheds were significantly protected from VS infection. The study is consistent with the role of biting insects in facilitating and spreading VS virus.

The USDA/ARS Plum Island Animal Disease Center provides access to Central and South American VS strains endemic to those countries. The facility is important as it provides the U.S. the ability to diagnose VS quickly and to differentiate it from Foot and Mouth Disease and other vesicular diseases.

Role of Arthropods (Insects)

University of Arizona scientists discussed the role of the Black fly (a common pest of livestock) in the transmission of VS virus. Black flies, infected with VS virus in the laboratory, have been found to have VS virus in their saliva, thus demonstrating they are likely capable of transmitting the VS virus to animals. In addition, the research indicates infected female Black flies may pass the virus to their offspring, which means that VS virus can continue to circulate in insect populations without the need for an animal host.

Scientists at the Arthropod-borne Animal Disease Research Laboratory (ABADRL) in Laramie, Wyoming have conducted extensive studies with *Culicoides variipennis* (a "gnat") and their role in the transmission of VS. This insect is also the North American vector of the bluetongue viruses. ABADRL scientists clearly demonstrated the actual transmission of VS virus to a mammal (guinea pig) by an insect. Moreover, the ABADRL scientists demonstrated that these insects secrete protein factors in their saliva that effect the immune response of the host animal. These results suggest that biting fly attacks on animals may result in animals which are more susceptible to infection with pathogens like VS virus.

Virus Diagnostics and Vaccines

Colorado State University researchers have established that isolates of VS virus from the 1995 outbreak in the U.S. were genetically different from those collected during the 1985 outbreak. These studies are consistent with earlier findings which demonstrate that VS viruses collected from livestock during different outbreaks (1985, 1982) are in fact genetically different from one another. Moreover, previous studies have shown that VS isolates identified in the U.S. are more similar to Mexican isolates from the same year, than U. S. isolates from different years.

USDA/VS scientists at the National Veterinary Services Laboratory (NVSL) have developed two new diagnostic tests that provide greater ease, speed and sensitivity for VS virus antibody detection that should be more appropriate in sero-surveillance than tests currently used.

Colorado State University scientists are continuing their efforts toward the development of a DNA Vaccine for VS. The development of a DNA vaccine would be extremely beneficial as they are stable, non infectious, and

would provide a marker to distinguish between animals that are vaccinated from natural infection. Although preliminary, these studies suggest promise for this technology in the development of a new generation of vaccines.